Radiation Therapy

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Introduction:-

Radiation therapy may be defined as treatment by means of radiations. The term Actino-therapy is also used for this.

Radiation therapy may include:

1. Infrared radiations
2. Ultraviolet radiations.

Infrared radiations

Introduction :-The infrared rays are electromagnetic waves with the wavelengths of 750 to 400000 nm

and frequency 4 × 1014 Hz and 7.5 × 1011 Hz. It lies beyond the red boundary of visible spectrum.

* Any hot body can produce infrared rays like the sun, electric bulb, coal fire, gas fire, etc. Sun is the natural source of infrared radiations.
* Infrared radiations can be produced by artificial generators.
* In the Physiotherapy departments infrared rays are produced by two

types of generators:

1. Nonluminous generators

2. Luminous generators.

Nonluminous generators provide infrared rays only whereas luminous generators emit infrared rays, visible as well as ultraviolet rays.

Therefore, nonluminous generators are termed as infrared radiation generators because they emit only infrared rays.

The heat produced by luminous generator is called the ‘radiant heat’.

Nonluminous Generators :-

Nonluminous generator consists of a simple type of element or coil wound on a cylinder of some insulating material such as fireclay or porcelain.

* An electric current is passed through the wire which results in the production of heat. This heat produces infrared rays which are transmitted through the porcelain.
* Porcelain gets heated by the method of conduction but the radiations generated in this way also include some of the visible rays.
* Therefore to avoid this, the coil is embedded in fireclay or porcelain or placed behind fireclay.

* Now the emission of rays is entirely from the fireclay which is commonly painted black and thus very few visible rays are produced.

* The element or the coil is thus placed at the focal point of a parabolic or spherical reflector.

* The reflector is mounted on a stand and its position can be adjusted as required

*All of the nonluminous generators take some time to get heated up for the production of infrared radiations, so they should be switched on before 5–7 minutes of the treatment.

Luminous Generators:-

Luminous generators emit infrared, visible and a few ultraviolet rays. These generators are in the form of incandescent lamps or bulbs.

* An incandescent lamp consists of a wire filament enclosed in a glass bulb, which may contain an inert gas at low pressure.
* The filament is a coil of fine wire which is usually made up of tungsten.
* Tungsten is a metal which is used because it can tolerate repeated heating and cooling.
*Incandescent bulb is usually mounted at the center of the parabolic reflector and the reflector is mounted on an adjustable stand.

* These luminous generators emit the electromagnetic waves with the wavelength in between 350 and 4000 nm.

* The front of the bulb is usually red so as to filter out the shorter visible and the ultraviolet rays.

Techniques of the Treatment :-

The choice of apparatus:-

In most cases luminous and nonluminous generators are equally suitable. When there is acute inflammation

or recent injury, the sedative effect of rays obtained

from nonluminous generator may prove more effective for relieving pain than the luminous source.

For lesions of a more chronic type luminous generator is more effective than non luminous type.

Preparation of the Patient :-

The clothes must be removed from the area to be treated and skin is checked for its sensation against heat and cold. The patient should be comfortable and fully supported so that he does not move unduly during treatment. The patient is warned that he should experience comfortable warmth and he should report immediately if the heating become excessive as undue heat may cause burn.

He should be instructed not to touch the apparatus and nor to move nearer to the apparatus.

Arrangement of the lamp and patient:-

The lamp is positioned so that it is opposite to the center of the area to be treated and the rays strike the skin at the right angle.The distance of the lamp from the patient should be around 50–75 cm depending upon the output of the generator.

Physiological effects

Infrared treatment produces heating effect in the superficial epidermis and dermis,

thus resulting in vasodilatation which increases blood circulation in that area. This will lead to more oxygen supply and nutrient supply in that area leading to draining of waste products resulting in the relief of pain. The sedative effectson nerve endings lead to reduction in the muscle spasm.

Indications:-

* Relief pain

* Increase muscle relaxation

* Increase blood supply

* Wound healing

Dangers:-

* Burn
* Electric shock
* Faintness
* Headache
* Injury to the eyes

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